



# Taxonomic studies on the genus *Zemerus* Boisduval from Indian Himalayas (Lepidoptera: Riodinidae)

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## Abstract

World over the genus *Zemerus* Boisduval contains two species i.e., *Z. emesoides* Felder and Felder and *Z. flegyas* Fruhstorfer. Whereas in India, this genus is represented by only one species *Z. flegyas* which is also its type species. The male and female genitalia of this type species are studied for the first time and accordingly the generic diagnosis has been updated by incorporating these characters. Besides some variations in wing maculation and venation have also been recorded in this species.

**Keywords:** *Lycaenidae*, *Riodinidae*, *Zemerus*, Male genitalia and Female genitalia.

## Introduction

The genus *Zemerus* Boisduval is known by only two species i.e., *Z. emesoides* Felder and Felder and *Z. flegyas* Fruhstorfer worldover (Bridges, 1988). Out of these, the former is confined to Peninsular Malaya, Singapore, Borneo and Neomalaya (d' Abrera, 1986; Eliot, 1992). The latter species *Z. flegyas* which is also the type species of the genus besides India (ranges from Mussoorie to Assam), also occurs in Sumatra, Nias, Java, Bali, Borneo, Lombok, Sumbawa, Sumba, Hainan, Siam, Tannasserim, Shan-States, Mergui, Burma, South China, Philippines, Malaya and Celebes and is separated into twelve subspecies (Shirozu, 1955; Forster, 1961; Fujioka, 1970; Shields, 1985; Varshney, 1994). In view of the distribution, the present sample has been identified as *Zemerus flegyas indicus* Fruhstorfer (Evans, 1932; Shields, loc. cit.; Haribal, 1992).

## Observations

### Genus *Zemerus* Boisduval

Common name: The Punchinello

Boisduval, [1836], (Roret's Suite a Buffon), Hist. nat., Ins. spec. gen. Lepid. 1 : pl. 21 (=pl. 5 C); Bingham, 1905, Fauna Brit. Ind., Butts I : Evans, 1932, Ident. Indian

Butts (2nd ed.) : 194; Eliot, 1992, Butts Mlay Penin. (4th ed.): 205.

*Zimeros* Ehrlich, 1958, Univ. Kansas Sci. Bull. 39 : 359.

### Type-species: *Papilio allica* Fabricius

Fabricius, 1787, Manittsa Ins. 2 : 52.

The nominal species *Papilio allica* Fabricius is currently treated as being the same as that represented by the older established nominal species *Papilio flegyas* Cramer.

**Generic diagnosis:** Frontoclypeal area dressed with equal ochraceous hair; eyes smooth; labial palpi porrect, not extending beyond head, second segment cylindrical, third segment gradually tapering into acute apex; antenna with well defined lanceolate club, nudum limited to apex; terminal tibial spurs absent; wings spotted and not striped, hindwing tornus neither produced nor tailed; forewing with 12 veins, vein Sc and vein R<sub>1</sub> approximating, vein 1A+2A weakly bifurcated at base, hindwing with vein R<sub>5</sub> and M<sub>1</sub> connate at origin, precostal vein present; male genitalia with uncal tip acute, not hooked, brachia long, V-shaped, apices acute, tegumen broad, vinculum laterally much reduced, deeply U-shaped, a large spade-like central sclerotized plate

present, valvae open fish-mouth shaped, juxta absent, aedeagus large, slender, slightly curvate, extending well beyond central sclerotized plate, coecum well developed and rounded, ductus ejaculatorius enters dorsad; female genitalia with genital plate weakly sclerotized, ductus seminalis enters ventrad near base of ductus bursae, basal portion of ductus bursae striped and sclerotized, corpus bursae subovate, not clearly differentiated, a pair of pustule-shaped signa present, apophyses anteriores and apophyses posteriores absent.

### *Zemerus flegyas* Cramer

Common name: The Punchinello Cramer, [1780], Uitl. Kapellen 3 (24) : 158 (*Papilio*); Bingham, 1905, Fauna Brit. Ind., Butts I: 499 (*Zemerus*); Evans, 1932, Ident. Indian Butts (2nd ed.): 194 (*Zemerus*); Shields, 1984, J. Bombay nat. Hist. Soc. 81 (3): 547 (*Zemerus*); Eliot, 1992, Butts Malay Penin. (4th ed.): 205 (*Zemerus*).  
*esla* Fruhstorfer, 1912, Ent. Rundsch. 29 (3): 23 (*Zemerus*).

### *Zemerus flegyas indicus* Fruhstorfer

Fruhstorfer, (1904), Berl. ent. Z. 48 (4): 282 (*Zemerus*).  
*confucius* Moore, 1878, Proc. Zool. Soc. Lond. (3): 701 (*Zemerus*).

**Male Genitalia:** Symmetrical; uncus large, bilobate, each lobe pentagonal in shape, apex acute, pilose; brachia long, V-shaped, basal portion broad and flat, distal portion cylindrical, tapering to acute slightly reflexed apices; subscaphium lens shaped, strongly developed; tegumen large, triangular dorsally, anterior margin more or less rounded, laterally produced into blunt processes; lateral windows large, well developed; vinculum thin, narrow, deep U-shaped, slightly oblique; saccus inconspicuous; a broad, large, spade-like, well sclerotized central plate present; valvae large, open fish-mouth like, broader than longer, costa ridge-like, sacculus with a digitus process below, ampulla large, arched, triangular, lobe-like, harpe large and triangular, pilose; juxta absent; aedeagus large, slender, bicurvate, ankylosed at zone, suprazone and subzone subequal, suprazone slightly narrower with a lanceolate elongated sclerotized plate in centre, apex broad, the latter extending beyond central sclerotized plate, opening of vesica terminal, subzone with coecum large, broad and rounded, bulbus ejaculatorius expanded dorsally, ductus ejaculatorius enters dorsad.

**Female Genitalia:** Lodix not developed; genital plate weakly sclerotized, with both lamella antevaginalis and lamella postvaginalis arcuate, the latter

relatively less sclerotized, followed by a broad sclerotized area and a patelliform sclerotized region comprising two reniform halves; ductus seminalis tubular, opening ventrally into basal portion of ductus bursae; the latter longer than corpus bursae, sclerotized, depressed distal portion more broader and striped, reception at corpus bursae imperceptible; corpus bursae subovate, semi-membranous, a pair of pustule-like atomarius signa present; apophyses anteriores and apophyses posteriores absent; papilla analis auriculate, large, apposed, outer margin more sclerotized, pilose. Forewing length; Male: 16-20 mm, Female: 19-20 mm.

### Material examined

Sikkim: 1 ♂, 25.IX.1995, Pakyong, 1650 m ASL, East District; 1 ♂, 24.V.1997, Temi, 1110 m ASL, East District; 1 ♂, 1 ♀, 2.X.1995, 1 ♂, 3.X.95, Namchi, 1350 m ASL, South District; 1 ♂, 14.IX.1996, Mangan, 1200 m ASL, North District.

Assam: 3 ♂, 25.IX.1996, 4 ♂, 26.IX.1996, 1 ♂, 27.IX.1996, 2 ♀, 29.IX.1996, 1 ♂, 13.X.1996, 2 ♂, 14.X.1996, 1 ♂, 1 ♀, 16.X.1996, Bashistha, 250 m ASL, Kamrup; 2 ♂, 30.IX.1996, Bhalukpong, 213 m ASL, Sonitpur.

Arunachal Pradesh: 2 ♂, 4 ♀, 1.V.1995, Naharlagun, 500 m ASL, Papum Pare; 2 ♂, 2.V.1995, Jollang Village, 560 m ASL, Papum Pare; 4 ♂, 1 ♀, 10.X.1996, Itanagar, 550 m ASL, Papum Pare.

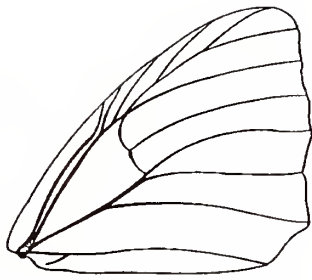
Range: 213-1650 m ASL.

**Old distribution :** Mussoorie to Assam and Burma.

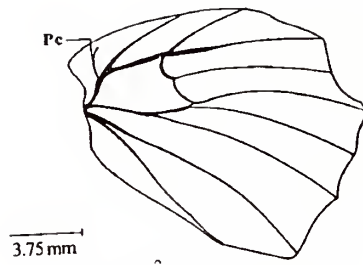
**Larval food plants:** *Maesa montana* DC. and *M. chisia* D. Don (Myrsinaceae) (Wynter-Blyth, 1957).

### Remarks

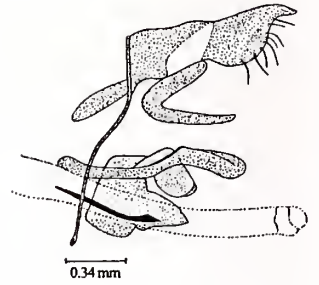
Having examined a large sample comprising twenty eight males and twelve females, some variations in terms of maculation, size and wing venation have been recorded as follows. The males collected from Namchi and Pakyong in Sikkim Himalaya are darker with less prominent markings on uppersurface of their wings. Regarding wing venation, the veins Sc and R<sub>1</sub> of the forewing may be very closely approximated and almost touching to each other (three males and two females) or moderately approximated (twenty five males and ten females). Owing to variations, mentioned above, a series of five males and three females were dissected and found to be conspecific genitally in either case. While dealing with butterflies of the Malay Peninsula, Eliot (1992) has not mentioned any type of such variations



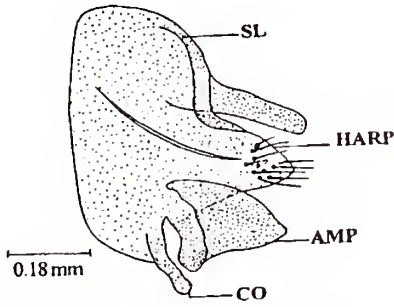
Venation of forewing



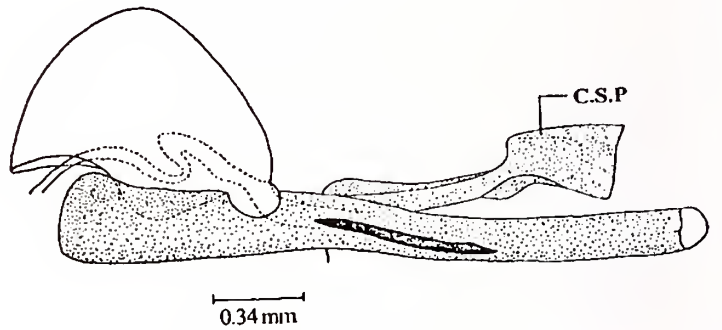
Venation of hindwing



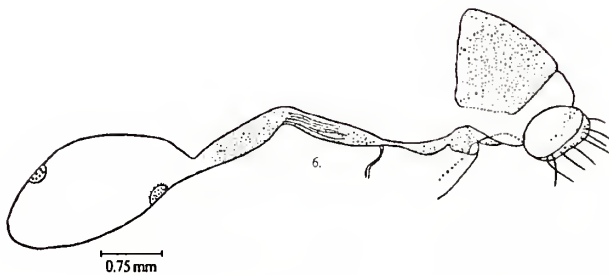
Male genitalia (lateral view)



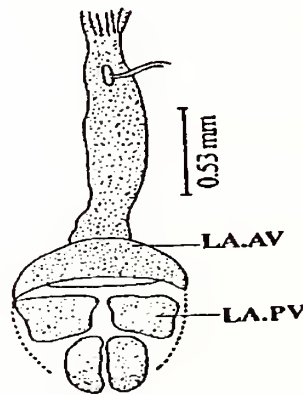
Left valva (inner view)



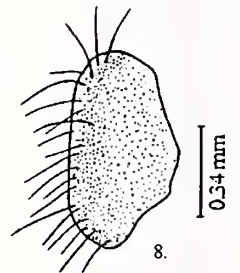
Aedeagus (lateral view)



Female genitalia (lateral view)



Genital plate



Papilla analis

Fig: *Zemerus flegyas indicus* Fruhstorfer

wing venation and maculation. The genitalia too have not been studied. Accordingly, both the male and female genitalia of this type-species are reported for the first time. About collection, in spite of repeated surveys, no specimen of this species could be collected from Mussoorie and adjoining areas which has otherwise been mentioned as a part of its range (Bingham, 1905; Evans, 1932; Peile, 1937; Wynter-Blyth, 1957; Shields, 1985; d'Abbrera, 1986; Mani, 1986 and Smith, 1989).

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